Alg. 2 Warm Up # 7-2 Solve:

1. $5 - (3x - 4) + 8 = 5 - \frac{3}{x}$

2. Find all the special points for the parabola.

$y = x^2 - 8x - 20$

HW Questions: Review & Preview

2-125. Decide whether each of the following functions is even, odd, or neither. Show or explain your reasoning.

a. $y = \frac{2}{3}x + 1$

$y = \frac{2}{3}(-x) + 1$

$y = -\frac{2}{3}x + 1$

Not the same or exactly opposite, so neither

b. $y = (x+2)^2$

$y = x^2 + 4x + 4$

$y = (-x)^2 + 4(-x) + 4$

$y = x^2 - 4x + 4$

Not exactly the same or exactly opposite so neither.

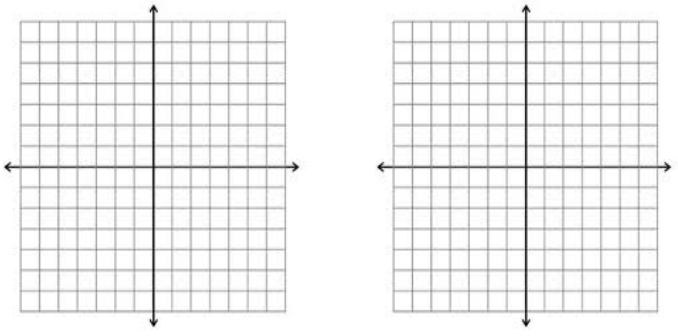
c. $y = |x| - x^2$

2-126. For each of the following functions sketch the graph of the original and of $y = f(-x)$.

a. $f(x) = 2|x-4|+3$

b. $f(x) = \dfrac{1}{x+4}$

c. Is either of these functions odd or even? Justify your answer.



2-127. A parabola has vertex (2, 3) and contains the point (0, 0). Find an equation that represents this parabola.

(x, y)

$y = a(x-h)^2 + k$

$y = a(x-2)^2 + 3$

$0 = a(0-2)^2 + 3$

$-3 \qquad -3$

$-\frac{3}{4} = \frac{a(4)}{4}$

$a = -\frac{3}{4}$

$y = -\frac{3}{4}(x-2)^2 + 3$

2-128. For each equation below, find the x- and y-intercepts and the locator point (h, k), then write the equations in graphing form.

a. $y = 7 + 2x^2 + 4x - 5$

b. $x^2 = 2x + x(2x - 4) + y$

$x^2 = 2x + 2x^2 - 4x + y$

$+2x + x^2 = 2x^2 - 2x + y$

$-2x^2 \quad -2x^2 + 2x$

$y = -x^2 + 2x$

$0 = -x(x - 2)$

$-x = 0$

$x = 0$

y-int: $(0, 0)$

x-int: $(0, 0)$ & $(2, 0)$

vertex: $(1, 1)$

$\frac{0+2}{2}$ $y = -(1)^2 + 2(1)$

$= -1 + 2$

2-129. Consider the system of equations at right:

$3y - 4x = -1$

$9y + 2x = 4$

a. What is the parent of each equation?

b. Solve this system algebraically.

c. Find where the two graphs intersect.

d. Explain the relationship between parts (b) and (c) above.

$2(9y + 2x = 4)$

$\rightarrow 18y + 4x = 8$

$3y - 4x = -1$

$21y = 7$

$\frac{21y}{21} = \frac{7}{21}$

$y = \frac{1}{3}$

$(\frac{1}{3},)$

2-130. Write an equation for each of the following sequences.

a. $10, 2.5, 0.625, \ldots$

1 2 3

×b ×b

b. $-2, -8, -14, \ldots$

$t(n) =$

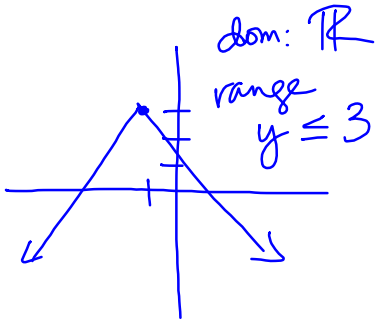
2-131. Find the intercepts, the locator point (h, k), the domain, and the range for each of the following functions.

a. $y = |x - 4| - 2$

b. $y = -|x + 1| + 3$

← reflect in x-axis

$(h, k) \rightarrow (-1, 3)$



CP's: 2- #132 ---> 137

2.2.4 How can I transform circles?

Transforming Non-Functions

p. 100

In this lesson, you consider two new parent equations that are different from the ones you have seen in the past because they are not functions. You will investigate them and apply the knowledge you have gained in this chapter to transform them. You will identify ways in which these new equations are different from the functions with which you have been working.

No grapher!

2-132. Begin by fully investigating $x = y^2$ and $x^2 + y^2 = 25$ as follows.

a. Without using your graphing calculator, make a table and a graph for each equation.

b. Marabel and Lissa were working on this problem. Marabel was making a table for $x = y^2$. For an x-value of 4, she found a y-value of 2. Lissa was watching and said, *"Wait! When x is 4, there is also another possible value for y."* What did Lissa mean? Look back at your tables and decide if there are more points you could add.

c. Now describe $x = y^2$ and $x^2 + y^2 = 25$ completely. This includes finding the domain and range of each equation, finding the important points such as intercepts, and describing what happens to y as x increases.

d. How are these relationships different from others you have been working with?

Share a grapher in your team:

2-133. Rewrite $x = y^2$ and $x^2 + y^2 = 25$ so that you can graph them with your graphing calculator. When you have rewritten both equations, try graphing them using your calculator. Do they look like the graphs you made in problem 2-132?

2-134. TRANSFORMATIONS OF NON-FUNCTIONS

In order to graph the equation of the circle on your graphing calculator, you had to express the non-function as two functions. Now apply your knowledge of transforming functions to learn about transforming circles.

Your Task: As a team, transform the graphs of $y = \pm\sqrt{25 - x^2}$ horizontally and vertically. Then find a general equation for this family of circles using h, and k. Be prepared to share your findings and your strategies with the class.

Discussion Points

How did we change the equation in other families so that the graph moves vertically? So that it moves horizontally?

How can we rewrite the two functions for a circle the same way?

2-135. Write your general equations for a circle in standard form by rewriting the equation $y = \pm\sqrt{-(x-h)^2 + 25} + k$ to isolate 25 on one side of the equation. What information does the locator point (h, k) give about the graph of the circle?

2-136. A circle has a special characteristic, its radius, which defines its size.

a. Refer back to the graph of $x^2 + y^2 = 25$. What is the radius? How is the radius of the circle related to the equation?

b. What would be the equation of a circle that has its center at $(5, -7)$ with radius 10? With radius 12?

c. Now generalize the connection between the radius and the equation of a circle. Write a general equation for a circle with any center (h, k) and radius r.

d. Given the equation $(x-3)^2 + (y+7)^2 = 169$, how can you find the radius of the circle?

2-137. Consider the equation $(x-4)^2 + (y+1)^2 = 16$.

a. What is the shape of the graph? How can you tell?

b. What information can you learn about the graph just by looking at the equation?

c. Sketch a graph of $(x-4)^2 + (y+1)^2 = 16$.

HW: 2-

139 ---> 145

Individual Short Quiz # 4: Thursday

Solve with x in denominator

Find special points of a parabola